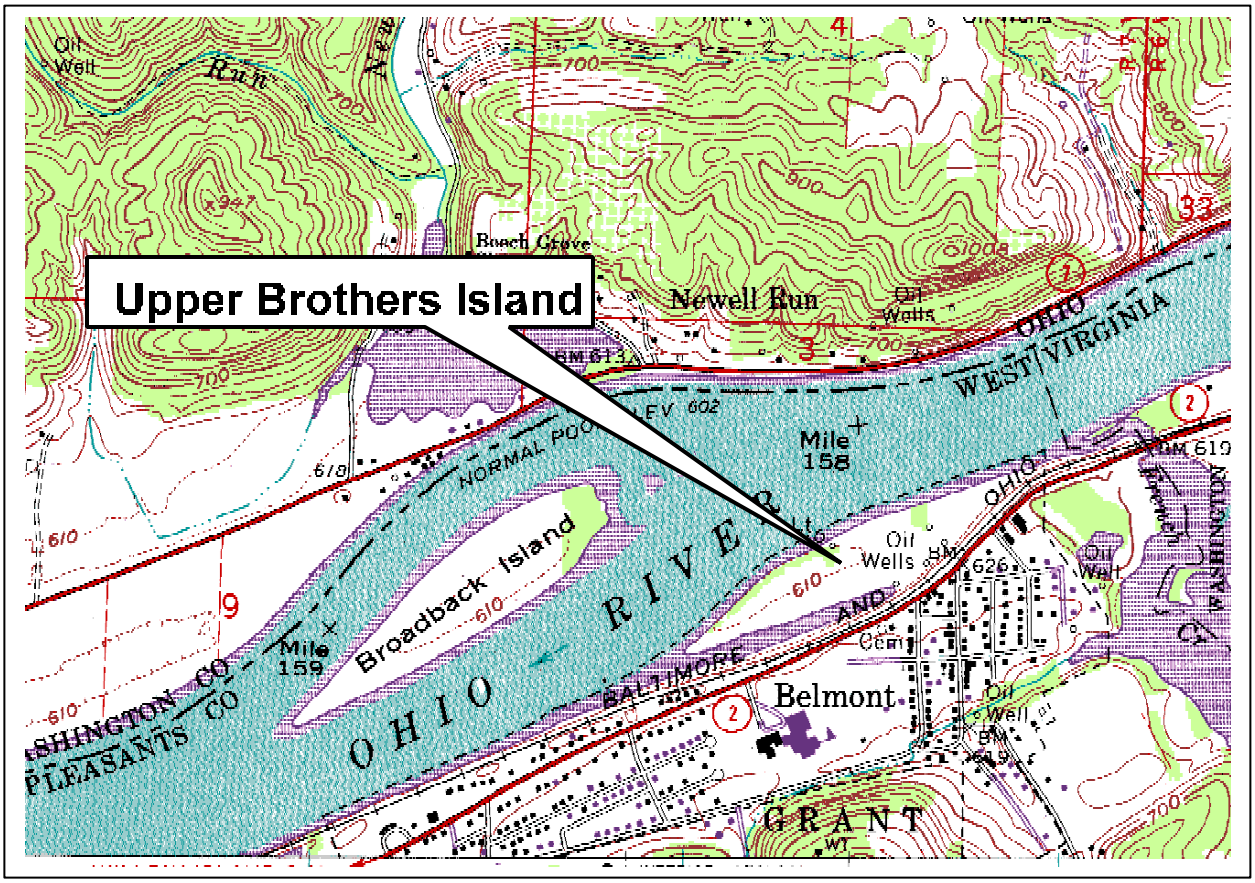
UPPER BROTHERS (FRENCH) ISLAND (WV-34)

1.0 Location

The proposed Upper Brothers Island restoration project area is located in Pleasants County, West Virginia adjacent to the community of Belmont, West Virginia. The project site is within the Willow Island Pool of the Ohio River. Upper Brothers Island is on the left descending bank at Ohio River Mile (ORM) 158.1. The project site is within the jurisdiction of the Huntington District, U.S. Army Corps of Engineers (USACE).



2.0 Project Goal, Description, and Rationale

The primary goal of the Upper Brothers Island Restoration project is to restore the island and associated backchannel at the site.

Upper Brothers Island, is currently no longer a true island in that the upstream portions of the backchannel have silted in and terrestrial/riparian vegetation has grown-up on the site. During normal pool conditions there is not a complete backchannel at Upper Brothers Island. Currently the aquatic habitat in the former backchannel is a shallow slough that connects to the Ohio River only at the downstream end of the island.

The project will result in the re-creation of the island and backchannel. The

backchannel will provide important off-channel aquatic habitat, increase aquatic habitat diversity and increase fish spawning habitat. Consequently habitat restoration will improve species diversity, facilitate a sustained fisheries resource, and improve the local recreational fishery.

The island will be created by reestablishing a new channel along the former backchannel location thereby restoring connectivity and flow through the channel. In order to restore flow through the backchannel a vane will be placed at the upstream mouth of the new backchannel to direct river flow into the channel. The upstream end of the island will be armored with rip-rap to protect the island from erosion.

3.0 Existing Conditions

Terrestrial/Riparian Habitat: Upper Brothers Island is an old Ohio River island. Over half of the original backchannel has become filled with sediments thereby resulting in the island becoming attached to the mainland. The terrestrial habitat on Upper Brothers Island is principally a mowed hay field. A narrow riparian band of trees is present along the Ohio River shoreline and along the downstream portion of the old backchannel (currently a slough). Black willow (*Salix nigra*) and silver maple (*Acer saccharinum*) are the most common tree species within the riparian zone. The mowed hayfield is composed of a variety of grasses and forbs. Wading birds (e.g. great blue heron) and waterfowl (e.g. Canada Goose) also use the old backchannel in the project area.


Mowed Field & Riparian Shoreline

Aquatic Habitats: Aquatic habitats at the Upper Brothers Island site include the Ohio River adjacent to the site and a shallow slough which represents the remnants of the old backchannel in the southern portion of the site. The Ohio River habitat adjacent to the site contains near shore littoral habitat as well as deeper water main channel border habitat. The existing habitat within the remnant backchannel is a shallow slough during most periods of the year. Approximately 1/3 to 1/2 of the old backchannel retains water. Silt, mud, and organic matter comprise the bottom sediments in the old backchannel. During periods of high river stage, the


Ohio River at Upper Brothers Island


Upper Brothers Old Backchannel

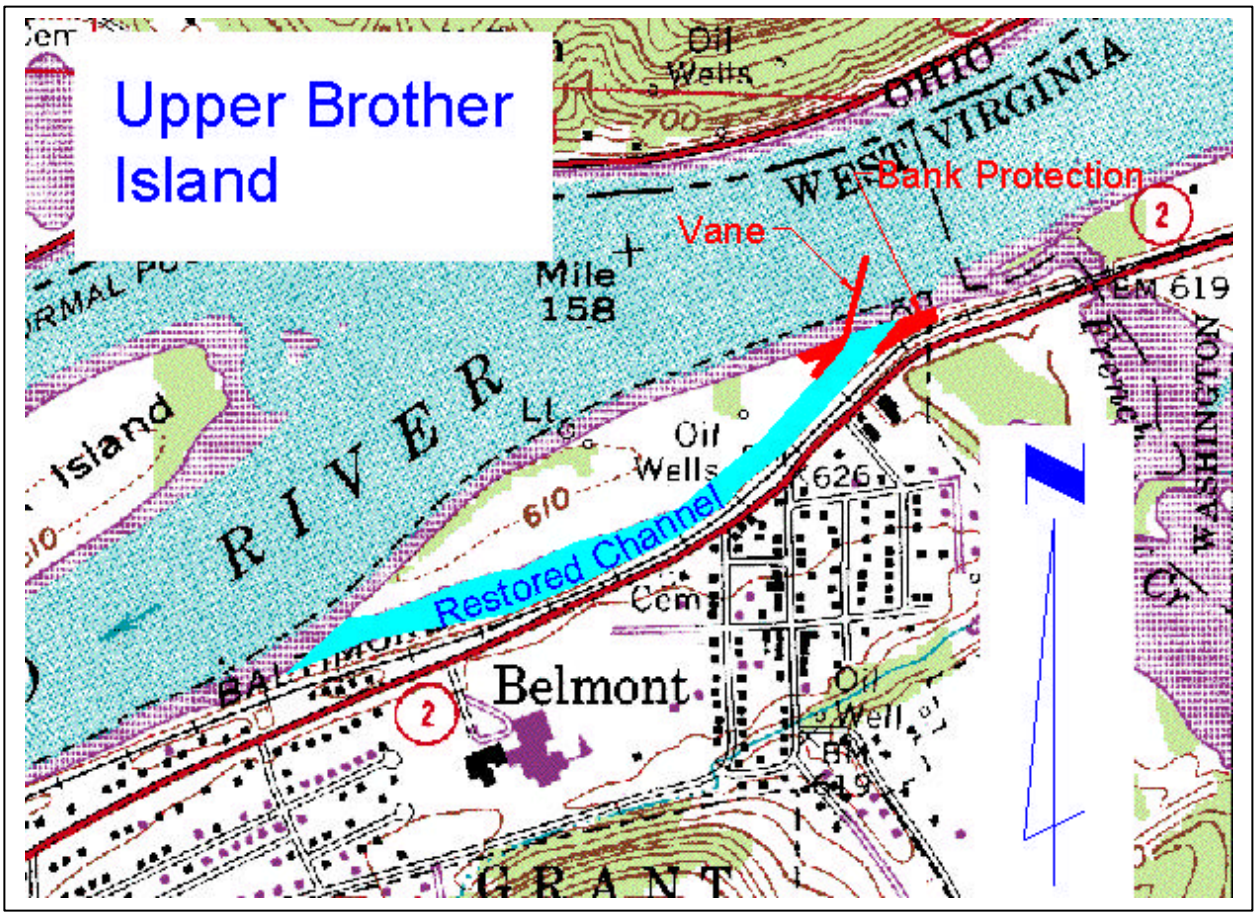
old backchannel is inundated. During normal river stages the old backchannel is an isolated slough with only a small downstream connection to the river. The slough/backchannel area provides habitat for a variety of fish species including largemouth bass (*Micropterus salmoides*) and bluegill (*Lepomis macrochirus*). These species and others (e.g. channel catfish, *Ictalurus punctatus*) have been found during West Virginia DNR surveys of similar habitats in the Ohio River (WVDNR, 1982).

Wetlands: Herbaceous emergent wetlands are present on the Upper Brothers Island site. Large portions of these wetland areas appear to be jurisdictional. Scrub shrub herbaceous emergent wetlands dominate the length of the old backchannel. Common wetland vegetation at the site includes smartweed (*Polygonum* spp.), cattail (*Typha* sp.), rose mallow (*Hibiscus* spp.), Willow (*Salix* spp.), and multiple species of grasses.


Upper Brothers Wetland Vegetation

Federally-Listed Threatened and Endangered Species: No federally listed threatened or endangered species are known to occur in Pleasants County, West Virginia USFWS, 1999).

4.0 Project Diagram



5.0 Engineering Design, Assumptions, and Requirements

5.1 Existing Ecological/Engineering Concern

The Upper Brothers Island backchannel has filled with sediments due to several factors. These factors include: raised water levels from the impoundment of Willow Island Pool; deposition of Ohio River silt-laden waters, especially during flood events; wave action from barge traffic.

5.2 Island & Backchannel Creation

Restoration of Upper Brothers Island would create 13.1 acres of backchannel habitat. To restore the island and backchannel 9 acres of forested land would have to be cleared. The created channel would vary from 130 to 250 feet wide. The maximum side slope would be 3:1. A vane would be provided at the mouth to divert water into the channel, and provide continuous flow.

5.3 Vane

The vane would be used to divert some of the flow of water into the restored channel and provide submerged aquatic habitat The structure would be 100 feet in length, pointing upstream at a 60 degree angle. The side slopes would be 1.5 to 1, and the structure would be toed into the sub-grade a minimum of 2 feet. The channel banks would be protected 50 feet up and down stream with rip-rap. The size of the rock used shall be uniformly graded limestone with each rock weighing between 50 and 150 pounds. Normally a well-graded rock would be used, however, a uniform gradation would provide better aquatic habitat.

5.4 Bank Protection

Due to the increased velocities created at the mouth of the island, the channel bank would need to be protected.

Design Features:

- Clean slope of all trees and brush
- Excavate bank to provide a 2:1 slope
- Cover slope with a filter fabric with the following properties:

Table 2. Properties of filter fabric

Physical Property	Test Method	Requirements
Equivalent Opening Size	Corps of Engineers CWO 2215-77	Equal to greater than U.S. No. 50 Sieve
Tensile Strength @ 20% (Maximum)	VTM-52	30 lbs./linear inch (Minimum)
Puncture Strength	ASTM D751	80 lbs. (Minimum)

- Rip-rap shall extend up the banks of the channel to a height of 12 feet vertically from the channel bottom (see figure in subsection 4).

5.5 Planning/Engineering Assumptions

Island Creation

- The site would be cleared of all trees and brush prior to excavation. All cleared material would be left in piles to enhance the wildlife habitat.
- Excavated material would be used to create the levee for the moist soil unit.

Vane and Bank Protection

- Average channel velocities are 3 feet per second.
- All rip-rap material would be shipped by barge to the project site. All costs for shipping are included in the material costs.

6.0 Cost Estimate (Construction):

Engineering costs for the proposed project are contained on Table 1. A detailed MCACES cost estimate for the proposed project is included in Appendix C.

Table 1. Engineering Costs.	
Item	**Cost**
Clearing	$19,700
Excavation of Backchannel	$520,400
Jetty	$15,700
Bank Protection	$18,100
Mobilization	$30,000
TOTAL	**$603,900**

7.0 Schedule:

The estimated construction time for this project is shown on Table 2.

Table 2. Engineering Costs.	
Item	**Time**
Clearing	18 Days
Excavation of Backchannel	176 Days
Jetty	5 Days
Bank Protection	3 Days
Mobilization	4 Days
TOTAL	**206 Days**

8.0 Expected Ecological Benefits

Terrestrial/Riparian Habitats: The beneficial impacts of the Upper Brothers Island restoration project would be primarily in-stream. There would be no reasonably foreseeable beneficial impacts to terrestrial/riparian resources as a result of implementing the proposed project. Beneficial impacts would be expected, however, if the current agricultural practices ceased and reforestation occurred.

Aquatic Habitats: Long-term beneficial impacts to aquatic resources would be anticipated as a result of implementing the proposed project. Creating a backchannel at Upper Brothers Island would result in long-term beneficial impacts to fishes due to the creation of this habitat type.

Backchannel habitat is sparse in the Ohio River, and the creation of additional backchannel habitat will provide improved slow flow habitat, spawning habitat, nursery habitat, and increased habitat diversity within the area. This backchannel restoration will benefit a wide variety of fishes, especially sport fish such as black basses (Sheaffer, 1986).

Wetlands: The beneficial impacts of the Upper Brothers restoration project would be primarily in-stream. There would be no other beneficial impacts to wetland resources as a result of implementing the proposed project.

Federally-Listed Threatened and Endangered Species: There would be no reasonably foreseeable beneficial impacts to threaten and endangered species as a result of implementing the proposed project.

Socioeconomic Resources: There would be short-term and long-term beneficial impacts to socioeconomic resources as a result of implementing the proposed project. The short-term beneficial impacts would be related to costs and local expenditures associated with the construction/dredging of the embayment. Long-term socioeconomic benefits would be realized through improved recreational fishing opportunities. Long-term indirect beneficial impacts will be realized through local expenditures for fishing tackle, food, gas, and other associated needs.

9.0 Potential Adverse Environmental Impacts

Terrestrial/Riparian Habitats: There would be long-term adverse impacts to terrestrial/riparian resources as a result of implementing the proposed project. Approximately 9 acres of riparian habitat (old backchannel) would be excavated in order to create the backchannel, thereby resulting in the permanent loss of terrestrial habitat.

Aquatic Habitats: Minor adverse impacts to existing aquatic biota in the remnant backchannel may occur as a result of constructing the new backchannel. In addition, sensitive aquatic species immediately downstream from the site could be adversely impacted by degraded water quality associated with sediments displaced during construction, however these adverse impacts to aquatic species would be short term.

Wetlands: There would be long-term adverse impacts to jurisdictional wetlands as a result of implementing the proposed project. Portions of the scrub shrub and herbaceous emergent wetlands that populate the old backchannel at Upper Brothers Island would be removed during the reconstruction of the new backchannel. The functional capacity of approximately 1 to 4 acres of jurisdictional wetlands will be degraded or removed. The loss of jurisdictional wetlands could be mitigated at an approved wetland mitigation site.

Federally-Listed Threatened and Endangered Species: There would be no reasonably foreseeable adverse impacts to threatened and endangered species as a result of implementing the proposed project.

Socioeconomic Resources: There would be no reasonably foreseeable adverse socioeconomic impacts as a result of implementing the proposed project.

10.0 Mitigation

Minor impacts associated with site restoration may occur during the construction of this project, however, no significant adverse impacts are expected. The use of best management practices and proper construction techniques would minimize adverse water quality impacts.

Jurisdictional wetlands present in the old backchannel would be adversely impacted (removed) during the reconstruction of the new backchannel. Mitigation via the creation of new wetlands could occur on or near Upper Brothers Island in conjunction with the re-creation of the backchannel.

11.0 Preliminary Operation and Maintenance Costs:

Table 3. Operation and Maintenance Costs		
Maintenance	**Frequency**	**Costs**
Dredge Backchannel of Island	35 Years	$28,000
Repair of Rock Structures	10 years	$6,000

12.0 Potential Cost Share Sponsor(s)

West Virginia Department of Natural Resources

13.0 Expected Life of the Project

It is anticipated that the recreated backchannel will maintain adequate depth and flow for a period of 35 years before maintenance dredging would be required.

14.0 Hazardous, Toxic, and Radiological Waste Considerations

Potential impacts of hazardous, toxic, and radiological waste (HTRW) at this concept site were visually assessed during a site visit on June 15, 1999.

Site Inspection Findings

The Ohio River flows from northeast to southwest past the project site located on the south side of the river in Pleasants County, West Virginia. The town of Belmont, West Virginia is located about 0.5 miles southwest of the partially silted channel, which is mouth of French Creek on the Ohio River.

The following environmental conditions were considered when conducting the June 15, 1999 project area inspection:

- Suspicious/Unusual Odors;
- Discolored Soil;
- Distressed Vegetation;
- Dirt/Debris Mounds;
- Ground Depressions;
- Oil Staining;
- Above Ground Storage Tanks (ASTs);
- Underground Storage Tanks (USTs);
- Landfills/Wastepiles;
- Impoundments/Lagoons;
- Drum/Container Storage;
- Electrical Transformers;
- Standpipes/Vent pipes;
- Surface Water Discharges;
- Power or Pipelines;
- Mining/Logging; and
- Other.

An old well was observed on the project site and an industrial site with above ground storage tanks is located to the east. This industrial site has the potential for underground storage tanks and surface water discharges. These items should be further evaluated and a detailed search

for HTRW activity should be conducted if land acquisition is planned for the site. None of the other environmental conditions listed above were observed in the project area.

15.0 Property Ownership & River Access

Selected data on properties immediately adjacent to the concept site was collected from the county courthouse of the respective county of each site. Data collected included map and parcel identification number, property owner's name and mailing address, acreage of the potentially affected parcel, and market value of the parcel. This procedure involved obtaining a plat or parcel map of the site and surrounding area which identified each parcel with a corresponding map and parcel number. The map\parcel identification number was subsequently used to determine the property owner's name and mailing address from records in the County Assessor's or County Auditor's office.

The market value of each parcel as contained in the property tables reflects the assessed valuation to supposedly market value ratio used by the State for taxation purposes. These assessed values reflect 1998 assessments. The assessed valuation ratio is 60 percent for West Virginia.

The above ratio was used to approximate the market value of each property. However, in many instances the resultant market value calculated under the above procedure is considerably below the actual value of the land in the real market. Local real estate brokers could provide a more accurate estimate of actual land values.

The collected property data indicate that the island and adjacent land are owned by private entities. Access to this site for the purpose of completing the proposed project will require agreements with local landowners for the construction activity associated with the creation of

the island and the disposal of excavated materials. In lieu of easements or agreements, land purchase may be an alternative for this project.

Table 4. Property Characteristics

Site Name: Upper Brothers (French) Island
Location: Pleasants County, West Virginia

Map/Parcel Number	Owner	Mailing Address	Market Value	Acreage
3/211	Demillion/Shirley Roby	P.O. Box 51 Belmont, WV 26134	$ 7,700	6.28
3/215	Lawrence/Betty Westbrook	P.O. Box 361 Belmont, WV 26134	$117,900*	4.00

* Denotes improvements on property.

16.0 References

Sheaffer, 1986	Sheaffer, W.A. and J.G. Nickum. 1986. Backwater areas as nursery habitats for fishes in Pool 13 of the Upper Mississippi River. Hydrobiology No. 136 pp. 131-140.
USFWS, 1999	U.S. Fish and Wildlife Service, July 6, 1999. Federally Listed Endangered and Threatened Species in West Virginia.

APPENDIX A Threatened & Endangered Species

APPENDIX B Plan Formulation and Incremental Analysis Checklist

Project Site Location:

The proposed Upper Brothers Island restoration project area is located in Pleasants County, West Virginia adjacent to the community of Belmont, West Virginia. The project site is within the Willow Island Pool of the Ohio River. Upper Brothers Island is on the left descending bank at Ohio River Mile (ORM) 158.1. The project site is within the jurisdiction of the Huntington District, U.S. Army Corps of Engineers (USACE).

Description of Plan selected:

The primary goal of the Upper Brothers Island Restoration project is to restore the island and associated backchannel at the site. The project will result in the re-creation of the island and backchannel. The backchannel will provide important off-channel aquatic habitat, increase aquatic habitat diversity and increase fish spawning habitat. Consequently this habitat restoration project will improve species diversity, facilitate a sustained fisheries resource, and improve the local recreational fishery.

The island will be created by cutting a new channel along the former backchannel location thereby restoring connectivity and flow through the channel. A vane will be placed at the restored upstream connection with the river to restore flow into the new backchannel. The upstream portion of the island will be rip-rapped to stabilize the bank.

Alternatives of the Selected Plan:

Smaller Size Plans Possible? **No** and description

Larger Size Plan Possible? **No** and description

Other alternatives? **No**

Restore/Enhance/Protect Terrestrial Habitats? Yes **Objective numbers met** T2, T1

Restore, Enhance, & Protect Wetlands? Potential **Objective numbers met** W1, W3

Restore/Enhance/Protect Aquatic Habitats? Yes **Objective numbers met** A6, A2, A8

Type species benefited: Wide variety of fish species including black basses.

Endangered species benefited: None

Can estimated amount of habitat units be determined: Approximately 13 acres of backchannel habitat will be created.

Plan acceptable to Resources Agencies?

U.S. Fish & Wildlife Service?
State Department of Natural Resources? Yes – West Virginia DNR

Plan considered complete? **Connected to other plans for restoration?**

Real Estate owned by State Agency? No **Federal Agency?** No
Real Estate privately owned? Land is privately owned
If privately owned, what is status of future acquisition Acquisition and/or agreements will be necessary

Does this plan contribute significantly to the ecosystem structure or function requiring restoration? What goal or values does it meet in the Ecosystem Restoration Plan?

Restores backchannel habitat. Backchannel habitat is sparse in the Ohio River and the creation of additional backchannel habitat will provide improved reduced current habitat, spawning habitat, nursery habitat, potential aquatic plant habitat and increased habitat diversity within the area. This backchannel restoration will benefit a wide variety of fishes, especially sport fish such as black basses.

Is this restoration plan a part of restoration projects planned by other agencies? (i.e. North American Waterfowl Management Plan, etc.)

No

In agencies opinion is the plan the most cost effective plan that can be implemented at this location?

Can this plan be implemented more cost effectively by another agency or institution?
Yes / No
Who:

From an incremental cost basis are there any features in this plan that would make the project more expensive than a typical project of the same nature? For embayment type plans is there excessive haul distance to disposal site? More expensive type disposal? Spoil that requires special handling/disposal?

Potential Project Sponsor:

Government Entity:_____
Non-government Entity _____

Corps Contractor _____Date_____

U.S. Fish & Wildlife Representative _____Date_____

State Agency Representative _____Date _____

U.S. Army Corps of Engineers Representative _____Date _____

Terrestrial Habitat Objectives

T1 Riparian Corridors

T2 Islands

T3 Floodplains

T4 Other unique habitats (canebrakes, river bluffs, etc.)

Wetland Habitat Objectives

W1 Forested Wetlands: Bottomland Hardwoods

W2 Forested Wetlands: Cypress/Tupelo Swamps and other unique forested wetlands

W3 Scrub/Shrub Emergent Wetlands: isolated from the river except during high water and contiguous (includes scrub/shrub wetlands in embayments and island sloughs)

Aquatic Habitat Objectives

A1 Backwaters (sloughs, embayments, oxbows, bayous, etc.)

A2 Riverine submerged and aquatic vegetation

A3 Sand and gravel bars

A4 Riffles/Runs (tailwaters)

A5 Pools (deep water, slow velocity, soft substrate)

A6 Side Channel/Back Channel Habitat

A7 Fish Passage

A8 Riparian Enhancement/Protection

APPENDIX C Micro Computer-Aided Cost Engineering System (MCACES)